

**University of Bahrain**  
**College of Information Technology**  
**Department of Computer Engineering**

**ITCE 341:  $\mu$ P**  
**Test 1**  
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**Time: 60 minutes**

**Date: April 2?, 2008**

Question	Points	Score
1	24	
2	25	
3	26	
4	25	
Total	100	

ID. No.	Name:	Sec.:
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**Show your work**

**Q1** If CS = F126

a) Calculate the physical start address of the segment

$F1260 + 00000$

**F1260**

b) Calculate the physical end address of the segment

$F1260 + 0FFFF$

**0125F**

(c) Is the location 0000:0000 inside the segment? Yes or no?

**Yes**

(d) Calculate the physical address when IP = 89A.

$F1260 + 0089A$

**F1AFA**

## Q2

(a) Assemble:

MOV SS: [875 h] , 432 h

How many clock cycles needed to execute the above instruction?

36 C7 06 75 08 32 04

Timing:  $10 + 6 + 2 + 4 = 22$  clock cycles

RCR BX , CL

D3 DB

(b) Disassemble:

C6 06 35 47 05 F7 25 00 02 95

C606354705      MOV    BYTE PTR [4735],05

F725            MUL    WORD PTR [DI]

0002            ADD    [BP+SI],AL

95              XCHG   BP,AX

### Q3

After executing the following lines, what will be the contents of the registers and the flags of the two tables below?:

**ORG 1234 h**

**SUB AX , AX**

**DEC AX**

**HHH: MOV DX , AX**

**MOV CL,3**

**RCL DX,CL**

**MOV CX , DX**

**SUB DH , DL**

**LEA BX , HHH**

Register:	AX	BX	CX	DX	IP
Content:	FFFF	1237	FFFB	04FB	1245

Flag:	CF	AF	SF	PF	ZF	OF
Content:	0	0	0	0	0	0

#### **Q4**

Write a program that calculates:  $Z = (X+Y)^2 / X$

Where X and Y are defined as unsigned bytes. (You have to define Z).

What would happen if Z overflows?

Data Segment

X        DB ...

Y        DB ...

Z        DD ?

Code Segment

MOV AL , X

MOV BL , AL

ADD AL , Y

**MOV AH , 0**

RCL AH , 1

MUL AX

XOR BH , BH

DIV BX

MOV Z , AX

MOV Z+2 , DX

**If Z overflows:** the program will be interrupted after executing the DIV instruction and the last two instructions will not be executed